

THAT WHICH IS CLAIMED:

1. An assembly for promoting growth of tissue samples requiring light to support proliferation, said assembly comprising:
 - 5 a plate defining therein a plurality of wells arranged in a well array, each of the plurality of wells configured to support and isolate one of the tissue samples; and
 - a plurality of light-emitting diodes arranged in a light-emitting diode array corresponding to the well array such that a fixed number of the light-emitting diodes are positioned opposite a respective one of the wells so as to shine light from the fixed
 - 10 number of light-emitting diodes into the respective one of the wells and promote proliferation of the tissue supported therein.
2. An assembly of Claim 1, wherein the fixed number of light-emitting diodes are centered above their respective one of the wells.
- 15 3. An assembly of Claim 2, wherein each of the fixed number of light-emitting diodes is one inch or less from the tissue sample in its respective one of the wells.
- 20 4. An assembly of Claim 2, wherein each of the plurality of light-emitting diodes emits a full spectrum of light frequencies.
5. An assembly for promoting growth of tissue samples requiring light to support proliferation, said assembly comprising:
 - a plurality of plates, each of the plates defining therein a plurality of wells
 - 25 arranged in a well array, each of the plurality of wells configured to support and isolate one of the tissue samples;
 - a rack including a plurality of supports spaced from each other and configured to support at least one of the plates;
 - a plurality of light-emitting diode arrays supported by the rack and
 - 30 cooperating respectively with the supports so that light from the light-emitting diode

array shines into the wells of the plate and promotes growth of the tissue samples contained therein; and

5 a robotic system configured to automatically load the tissue samples into each of the plurality of wells in the plurality of plates and to position each of the plurality of plates on one of the plurality of supports opposite one of the plurality of light-emitting diode arrays and to remove each of the plurality of well plates from one of the plurality of supports for additional downstream processing.

6. An assembly of Claim 5, wherein each of the supports include a register
10 device which urges the plate supported thereon into a register position such that each of the light emitting diodes is centered opposite its respective one of the wells.

7. An assembly of Claim 6, wherein the support comprises a shelf and the
15 register device is a register depression defined in the shelf.

8. An assembly of Claim 6, wherein the register device is selected from the
group consisting of:

photo-optic sensors;
mechanical stops; or
20 magnetic registers.

9. An assembly of Claim 5, wherein the rack further comprises a volume,
measured in cubic feet defined by a length, a width, and a height of the rack such that the
rack supports the plurality of plates in a high-density arrangement such that the rack
25 contains at least about 288 wells per cubic foot.

10. An assembly of Claim 5, wherein each of the plurality of light-emitting
diode arrays emits a full spectrum of light frequencies.

11. An assembly for promoting growth of tissue samples requiring light to
30 support proliferation, said assembly comprising:

a plurality of plates, each of the plates defining therein a plurality of wells arranged in a well array, each of the plurality of wells configured to support and isolate one of the tissue samples;

5 a rack including a plurality of supports spaced from each other and configured to support at least one of the plates;

a plurality of light-emitting diode arrays supported by the rack and cooperating respectively with the supports so that light from the light-emitting diode array shines into the wells of the plate and promotes growth of the tissue samples contained therein, wherein each of the light-emitting diode arrays comprises a plurality of
10 light-emitting diodes arranged in an array corresponding to the well array of the plate such that each of the light emitting diodes is positioned opposite a respective one of the wells; and

a robotic system configured to automatically load the tissue samples into each of the plurality of wells in the plurality of plates and to position each of the plurality
15 of plates on one of the plurality of supports opposite one of the plurality of light-emitting diode arrays and to remove each of the plurality of well plates from one of the plurality of supports for additional downstream processing.

12. An assembly of Claim 11, wherein each of the supports include a register
20 device which urges the plate supported thereon into a register position such that each of the light emitting diodes is centered opposite its respective one of the wells.

13. An assembly of Claim 12, wherein the support comprises a shelf and the register device is a register depression defined in the shelf.
25

14. An assembly of Claim 12, wherein the register device is selected from the group consisting of:
photo-optic sensors;
mechanical stops; or
30 magnetic registers.

15. An assembly of Claim 11, wherein the rack further comprises a volume, measured in cubic feet defined by a length, a width, and a height of the rack such that the rack supports the plurality of plates in a high-density arrangement such that the rack contains at least about 288 wells per cubic foot.

5

16. An assembly of Claim 11, wherein each of the plurality of light-emitting diodes emits a full spectrum of light frequencies.

17. An assembly for housing a plurality of plates and supplying light to a plurality of tissue samples, each of the plates defining therein a plurality of wells arranged in a well array, each of the plurality of wells supporting one of the tissue samples, said assembly comprising:

10 a rack including a plurality of supports spaced from each other;
a plurality of light-emitting diode arrays each including a plurality of light-emitting diodes arranged in an array corresponding to the well array wherein each
15 of the light-emitting diode arrays is supported by the rack opposite a respective one of the shelves so that light from each of the light-emitting diodes shines into a respective one of the wells of the plate supported on the shelf; and
a robotic system configured to load each of the plurality of wells with one of the plurality of tissue samples, and to position each of the plurality of plates in one of
20 the plurality of supports, and to remove each of the plurality of plates from one of the plurality of supports for additional downstream processing.

18. An assembly of Claim 17, wherein each of the shelves is configured to urge at least one of the plurality of plates into a register position.

25

19. An assembly of Claim 17, wherein each of the shelves defines a register depression shaped to urge the plate into a register position.

20. An assembly of Claim 17, wherein the rack further comprises a volume, measured in cubic feet defined by a length, a width, and a height of the rack such that the
30

rack supports the plurality of plates in a high-density arrangement such that the rack contains at least about 288 wells per cubic foot.

21. An assembly of Claim 17, wherein each of the plurality of light-emitting
5 diodes emits a full spectrum of light frequencies.

22. An assembly for promoting growth of tissue samples requiring light to support proliferation, said assembly comprising:

a plurality of plates, each of the plates defining therein a plurality of wells arranged in a well array, each of the plurality of wells configured to support and isolate
10 one of the tissue samples;

a rack including a plurality of supports spaced from each other and configured to support at least one of the plates;

a plurality of light-emitting diode arrays supported by the rack and cooperating respectively with the supports so that light from the light-emitting diode
15 array shines into the wells of the plate and promotes growth of the tissue samples contained therein, wherein each of the light-emitting diode arrays includes a circuit board and a plurality of light-emitting diodes carried by the circuit board and wherein the rack further includes a plurality of card edge connectors each configured to receive the circuit board of one of the light-emitting diode arrays and support the circuit board and light-
20 emitting diodes above the respective one of the shelves; and

a robotic system configured to load each of the plurality of wells with one of the plurality of tissue samples, and to position each of the plurality of plates in one of the plurality of supports, and to remove each of the plurality of plates from one of the plurality of supports for additional downstream processing.

25

23. An assembly of Claim 22, wherein the rack further comprises a volume, measured in cubic feet defined by a length, a width, and a height of the rack such that the rack supports the plurality of plates in a high-density arrangement such that the rack contains at least about 288 wells per cubic foot.

30

24. An assembly of Claim 22, wherein each of the plurality of light-emitting diodes emits a full spectrum of light frequencies.